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# Lateral wall orbital decompression in Graves' orbitopathy

**S. Sellari-Franceschini[1], R. Lenzi[1], A. Santoro[1], L. Muscatello[1], R. Rocchi[2], M. A. Altea[2], M. Nardi[3], L. Megna[3], C. Marcocci[2]**

[1]Unit of Otorhinolaryngology, Department of Neuroscience, University of Pisa, Pisa, Italy; [2]Unit of Endocrinology, Department of Endocrinology and Metabolism, Orthopaedics and Traumatology, Occupational Medicine, University of Pisa, Pisa, Italy; [3]Unit of Ophthalmology, Department of Neuroscience, University of Pisa, Pisa, Italy

*S. Sellari-Franceschini, R. Lenzi, A. Santoro, L. Muscatello, R. Rocchi, M. A. Altea, M. Nardi, L. Megna, C. Marcocci: Lateral wall orbital decompression in Graves' orbitopathy. Int. J. Oral Maxillofac. Surg. 2010; 39: 16–20.* 

*Abstract.* Orbital decompression can be carried out, for rehabilitative reasons, using various techniques, but a general consensus on the ideal surgical approach has not been reached. Postoperative diplopia is the most common side effect of decompression surgery. The authors report 39 patients (72 orbits) who underwent lateral wall orbital decompression. Mean preoperative and postoperative Hertel exophthalmometry were $22.8 \pm 2.2$ mm (mean $\pm$ SD; range 16–26 mm) and $18.2 \pm 2.1$ mm (range 15–22 mm), respectively. Mean proptosis reduction was $4.5 \pm 1.9$ mm. A new appearance of diplopia postoperatively in the extreme gaze direction was observed in three patients (8%). The complication rate in this series was low, making the procedure safe and well tolerated. In the authors' opinion, when a single-wall approach is feasible, lateral wall decompression should be the first choice because of its effectiveness in terms of proptosis reduction and safeness in terms of postoperative diplopia.

Keywords: orbit; surgery; surgical decompression; Graves' ophthalmopathy; exophthalmos.

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Graves' orbitopathy (GO) is the most common cause of orbital inflammatory disorders in adults. The increased orbital content due to the inflammatory process increases intraorbital pressure producing proptosis of various degrees. Other manifestations of GO are eyelid oedema, conjuntival hyperaemia, photophobia, extraocular muscle impairment with consequent diplopia, and, in some cases, optic neuropathy with sight loss or visual field defects.

Treatments for GO include systemic immunosuppression with glucocorticoids, orbital radiotherapy and surgical therapy (orbital decompression, strabismus surgery, blepharoplasty)[3]. The main indications for orbital decompression are optic neuropathy and severe proptosis with consequent exposure keratopathy and disfigurement[12]. Orbital surgery is also indicated for cosmetic or rehabilitative reasons in patients with inactive GO.

Orbital decompression can be carried out using various techniques. Decompression of the medial wall and orbital floor through a transantral approach is popular[6,17], and, recently, a transnasal endoscopic technique has replaced the traditional procedure[11]. Decompression of the lateral wall, alone or associated with the medial wall, has been proposed by many authors[7,8,13]. Olivari has described a transpalpebral technique involving the removal of intraorbital fat[14].

Postoperative diplopia remains the most common side effect of decompression surgery, and a general consensus on the ideal surgical approach has not been reached. The medial and inferior rectus are the muscles most often involved in the inflammatory process, and usually the removal of bone in their proximity is responsible for a high risk of postoperative diplopia. Medial and inferomedial orbital decompressions are associated with a high risk of such a complication because of inferomedial shifting of the orbital contents[1,6,10]. Balanced medial and lateral wall decompression has decreased the risk of postoperative diplopia because less inferomedial shifting is expected[8,16]. Based on this assumption, the removal of the lateral wall only should be even safer because bone removal is performed almost behind the muscle cone, reducing the possibility of postoperative muscular and ocular displacement[7].

Since 1992, the authors have performed orbital decompression on 482 patients (913 orbits). Until 1998, they used the Walsh–Ogura technique[15,17], the coronal approach, or a combination of the two. Since 1998, they have mainly adopted a balanced technique that they consider to be the preferred procedure, given the great adaptability of the technique to the patient's needs and the relatively low percentage of postoperative extraocular muscle impairment[16]. They recognize that in some patients a two-wall decompression may be too invasive, and a single wall procedure, medial or lateral, depending on the preoperative clinical presentation, could be appropriate. The choice between medial and lateral wall removal is often based on the surgeon's experience rather than on the patient's needs.

In this study, the medical records of a series of patients with GO who underwent only orbital decompression to the lateral wall are reviewed.

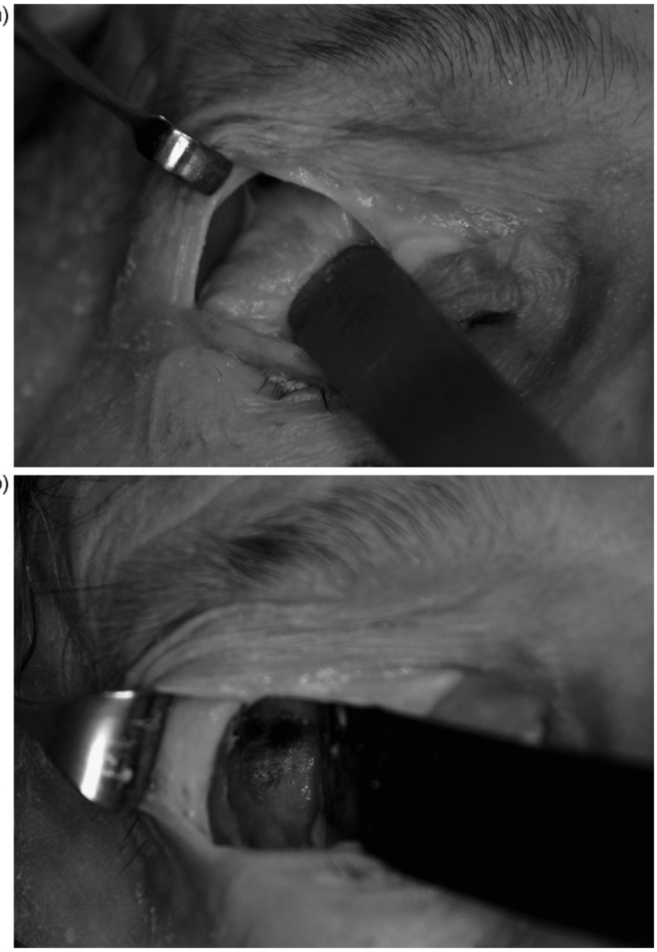
(a)
(b)


*Fig. 1.* Cadaver dissection showing the approach to the lateral orbital wall. After a superior blepharoplasty incision the orbital rim is identified and a subperiosteal dissection of the inner orbital wall is made (a). The lateral orbital wall is then drilled away (b).

## Materials and methods

A retrospective review of the medical records of 39 patients (72 orbits) who underwent lateral wall orbital decompression for GO between July 2005 and June 2008 was conducted. Demographic data, length of hospital stay, proptosis reduction, worsening or new onset of postoperative diplopia, major (severe haemorrhage and/or CSF leak, visual loss, meningitis, permanent deficit of V1 and/or V2) and minor (mild intraoperative haemorrhage and/or CSF leak, corneal disepithelialisation, postoperative chemosis, temporary impairment of V1 and/or V2) surgical complications were recorded. Minimum follow-up was 6 months.

### Criteria for inclusion

Patients who underwent only lateral wall orbital decompression through a superior blepharoplasty approach or brow incision were included in the study. Patients decompressed on the lateral wall through a coronal approach were not included to obtain a more homogeneous sample. All patients had a preoperative Hertel exophthalmometry value equal to or less than 26 mm in the worst eye. All patients were operated on for rehabilitative reasons and presented a variable degree of medial rectus muscle enlargement, often associated with preoperative diplopia. Patients with a follow-up shorter than 6 months were excluded from the study.

### Surgical technique

All the procedures were performed under general anaesthesia. An upper blepharoplasty incision was used in all but one case. In this patient a brow incision was used. After the skin incision, the orbicularis oculi is traversed, dividing the muscle parallel to the fibres. By means of a careful dissection of the preseptal space the orbital rim is reached, and then a subperiosteal dissection of the lateral wall and of the outer portion of the superior and inferior walls is carried out. With the help of a malleable retractor the eye globe is gently divaricated, and with cutting and diamond burrs the lateral wall of the orbit is drilled away, sparing the lateral orbital frame (Fig. 1). The outer part of the orbital roof and zygomatic bone lateral to V2 are removed. Drilling stops when the deep surface of the temporalis muscle and the dura mater of the anterior and middle cranial fossa come into view (Figs. 2 and 3). A thin shell of bone is usually left in place to partially cover the deep surface of the temporalis muscle. At this point, the periorbita is incised from posterior to anterior to permit the dislocation of the orbital fat and, when feasible, part of it (1–2 cc, according to the fibrous status of the fat) is gently removed.

At the end of the operation the skin is sutured and suction drains are inserted into the orbit for 24 h. Compressive medication is applied for at least 24 h. Perioperative antibiotics are always used for a mean of 3 days.